

are only two millimeters long, but *Eristalis tenax*, which has a proboscis 7–8 mm. in length, can easily do so. Both the *Dexiidae* and *Tachinidae* can reach the pollen.

Only one specimen of the order Hemiptera was collected. *Euschistus fissilis*, of the *Pentatomidae*, has a hard, 4-jointed beak more than 4 mm. long. It also sucks the juices of leaves and of caterpillars.

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ADDITIONAL NOTES ON NAJAS IN MINNESOTA

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At the time *Najas olivacea* was described¹ it was known from only one station in Minnesota; namely, Norway Lake, Kandiyohi County, in the south-central part of the state, where it was first found in the late summer of 1932. It was again collected at the same place in 1933, but all subsequent attempts to obtain additional material of the species from the type locality have proved fruitless. The apparently complete disappearance of the species from Norway Lake is perhaps to be accounted for by the extensive lowering of the lake level following the severe droughts that prevailed in 1934 and again in 1936. A part of the zone of mucky bottom on which the plant was found has now become exposed, and over the remainder the water has apparently been too shallow for it successfully to maintain itself. Several lakes of the surrounding territory, most of which have suffered less lowering of levels, have been diligently searched for possible additional stations, but uniformly without success. However, in the early summer of 1937, Mr. John B. Moyle, of the State Conservation Department, discovered the plant growing in great abundance in Snail Lake, situated near the middle of Ramsey County, approximately 5 miles north of the St. Paul city limits. The new station is approximately 100 miles east-southeast of Norway Lake. Its proximity to the Twin Cities has offered opportunity for a more intimate acquaintance with this quite distinct yet apparently long overlooked member of our Najad flora, and the following notes are presented in the hope that they may be of help to those who are on the lookout for the species in other parts of the country.

The plant grows on somewhat mucky lake bottoms, most profusely

¹ Rosendahl and Butters, *RHODORA* 37: 345. 1935.

at depths of about 1 meter. The stems attain lengths up to 40 cm. and are relatively stout, the lower internodes sometimes measuring 2 mm. in diameter in the living condition. The plants are very turgid, the leaves standing out stiffly, and the stems being so brittle that they break freely at the nodes in the process of collecting and handling.

In monographic and other systematic treatments the genus *Najas* is stated to consist of annual herbs. *N. olivacea* proves to be an exception to the rule since it renews freely from the persistent lower portions of the stems of the previous season. In greenhouse experiments Mr. Moyle has found that the plant propagates readily from the broken off, densely leafy tips of the vigorous vegetative shoots. It seems likely that in nature these shoot tips may act as hibernacula, but so far no direct observations in support of this view have been made.

Unlike the other species of *Najas* occurring within our range *N. olivacea* fruits very sparingly. The relatively few flowers that develop beyond the rudimentary stage are borne almost exclusively on the rather short (5-12 cm. long), first-formed shoots of the season's growth. Very rarely are fruits found on the more elongated, freely branching shoots that develop later. Generally the pistillate flowers are borne at the lower and the staminate at the upper nodes of the flowering shoots, but this is not invariably the rule, as fruits are sometimes found in the higher leaf axils. The quadrilocular anther is very plump, hence the staminate flowers are much more conspicuous in this species than in *N. flexilis*, which has a very slender and unilocular anther.

The pollen grains of *N. olivacea* are oblong-oval in outline (averaging 33 x 62 μ), with finely granular contents, whereas in *N. flexilis* they are much more elongate (averaging 26 x 82 μ) and coarsely granular. The pollen of *N. guadalupensis* is similar in shape to that of *N. olivacea* but slightly smaller (27 x 51 μ) and coarsely granular as in *N. flexilis*.

Extensive collecting of aquatic plants incident to a survey of Minnesota lakes by the State Conservation Department has resulted in considerable extension of the known ranges of all the *Najas* species occurring in the state. Thus, *N. marina*, which previously has been reported only from Big Stone and Pope Counties has now been found in Kandiyohi and Norway Lakes in Kandiyohi County and also in Maple Lake in Polk County, about 15 miles east of Crookston in the Red River Valley. The water in all the lakes where this species has

been collected is relatively high in dissolved carbonates and sulphates, but not to the extent of being brackish.

Najas gracillima, previously known only from a single small pond in Ramsey County has recently been collected in two additional widely separated localities, one of which is in Cook County in the extreme northeastern corner of the state, the other at the headwaters of the Mississippi River in Itasca Park.

Of *N. guadalupensis* only two earlier collections have been reported. Both of these were made about 40 years ago in the extreme southeastern part of the state. During the last two seasons the species has been collected in Hennepin, Freeborn, Martin, Renville, Yellow Medicine, Swift, Lac qui Parle, and Lincoln Counties. The known range of the species has accordingly been extended some 75 miles northward and clear across the southern third of the state to the South Dakota boundary.

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SELENIA DISSECTA IN NEW MEXICO.—In a note in RHODORA for November, 1938, Mr. Robert F. Martin calls attention to the discovery of *Selenia dissecta* near Capitan, Lincoln County, New Mexico, April 12, 1929, by Mr. M. W. Talbot (now chief of range research, California Forest and Range Experiment Station). It seems worthwhile to record that the range plant herbarium of the U. S. Forest Service in Washington, D. C., contains four considerably earlier specimens of this crucifer collected in New Mexico as follows:

LINCOLN NATIONAL FOREST, OTERO COUNTY. (1) Mr. Joe A. Morgan's (a rancher) no. A-2 (Forest Service serial no. 31908). Collected March 15, 1919, at 4300 ft., sandy adobe soil. Sec. 32, T. 17 S., R. 10 E., Morgan's Ranch. Associated with *Euklisia valida* and *Sophia ochroleuca*.

In Mr. James T. Jardine's report on this specimen (prepared by myself) to the Regional Forester at Albuquerque, under date of January 5, 1920, this comment was made: "Apparently the first record of the occurrence of this species in the State of New Mexico; it is a rather little known species hitherto reported only from extreme western Texas near the New Mexico border."

JORNADA EXPERIMENTAL RANGE, DOÑA ANA COUNTY. (2) Paul B. Lister's no. 347 (Forest Service serial no. 42276). Collected February 28, 1923, at 4600 ft., in granitic soil. (3) Paul B. Lister's no. 361 (Forest Service serial no. 45874). Collected April 20, 1923, at